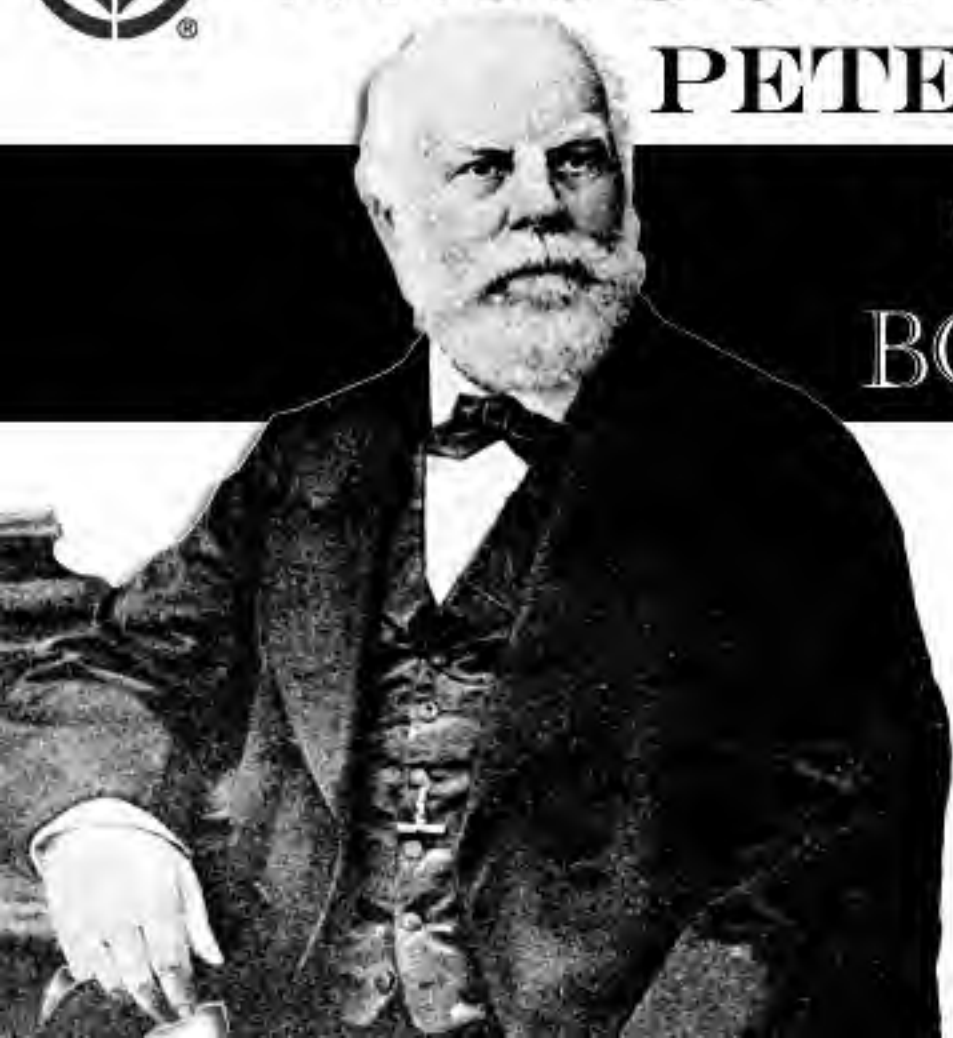




MISSOURI BOTANICAL GARDEN
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GEORGE ENGELMANN
BOTANICAL NOTEBOOKS

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Muricata spiralis
P. costata?

No 2 Bolander

(cons epical!)

118

TRANS. OF THE ACAD. OF SCIENCE.

605-8

interrupted descent and ascent took place from January to December, we find in 1862 some interruptions in the steps of that ladder. The electricity in February, 1862, is about four degrees higher than that of January, April somewhat higher than March, and July is the lowest instead of September in 1861. These trifling irregularities may be accounted for by differences in temperature and relative humidity, and by a greater number of thunderstorms in 1862. January of 1862, for instance, was so unusually rainy, that its relative humidity too was unusually high, diminishing thus electricity. But the general features of distribution of electricity throughout the year are apparent in both years, and we may in that respect divide the twelve months of each year into two or three groups. Computing the months which give the highest electricity and those which give the lowest in each year, we find that in both years the months of January, February, March, April, November and December exhibit the highest, and the months of May, June, July, August, September and October the lowest electricity. The first group gives

The aggregate monthly mean of 71.5 degrees of electricity in 1861	and 74.6	"	"	1862
While the second group gives 29.0	"	"	"	1861
and 25.7	"	"	"	1862

The second group prevailed therefore in 1861 the 1st



0 1 2 3 4 5 6 7 8 9 10

cm

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VI. The appearance of negative electricity was connected in

1861. No. times.	1862. No. times.	
30	32	with thunderstorms.
23	28	with rains without thunder and lightning.
20	4	with dry storms (without rain and without thunder and lightning).
4	3	with snow.
1	0	with fog.
78	67	

VII. Relation of Rain and Snow to Electricity.

Rain without thunderstorm was accompanied

	By Positive Electricity.		By Negative Electricity.		By no Electricity.	
	In 1861.	In 1862.	In 1861.	In 1862.	In 1861.	In 1862.
January.....	7	5	3	2	2
February.....	2	1	4	1
March.....	5	6	4
April.....	3	6	7	11	1
May.....	7	1	1	3	1
	8	1

11700

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Pinus muricata

Oct 25 1870

apicalis

Tomales Bay Bolander



sketches (19 years old) 9-10 mm long

both long & short leaves

x 60



x 60

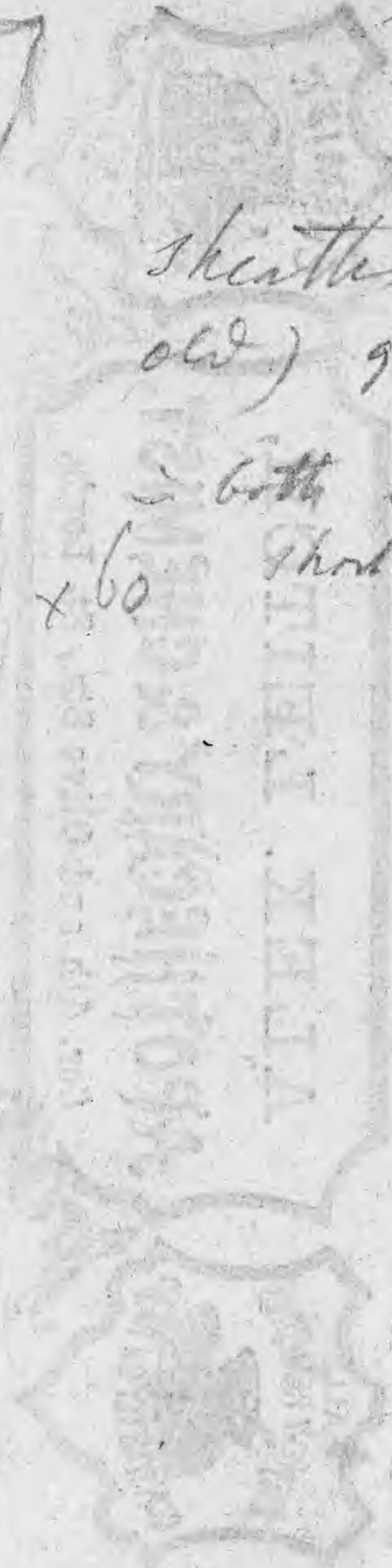
x 30



x 30

larger leaf 130 mm long

smaller leaf 70 mm long



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cm

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CHEMIST



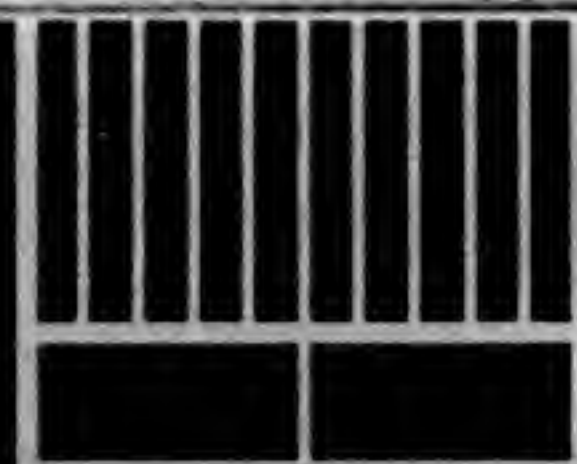
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Pinus muricata Don

including *P. Edgariana* Harkn

603-4

JOURNAL OF PROCEEDINGS.

161

reins zur Beförderung des Gartenbaues, 1860, Nos. 1-52—1861, Nos. 1-6, Berlin, *from the Society*; Atti della Società Ital. di Scienze Nat., Milano, Vol. II., Fasc. 2, 1860, *from the Society*; Atti dell I. R. Istituto Veneto, T. V., Ser. iii., Disp. 10—T. VI., Ser. iii., Disp. 1-3, 1860-1, *from the Society*; Visir- und Recheninstrumente von Ernst Sedlaczeh, Wien, 1856, — Rechenmacher, von E. Sedlaczeh, Wien, 1856, — Compendium der ebenen und sfärischen Trigonometrie von E. Sedlaczeh, Wien, 1856, *from Mr. Semoner*; L'Ortolano, Giornale Popolare d'Orticoltura, Trieste, Anno I. 1-12, III. 1-9, 1859-60, — Allocuzione da Prof. Adolfo Stopice, Trieste, 1860, *from the Society*; Fr. Ambrosii Flora Tiroliae Australis, Vol. II., Pt. 4, *from the Author*; Verhandl. des Naturh. Vereins, Bonn, Jahrg. XVII., 1-2, 1860, *from the Society*; Sitzungsab. der K. K. Akad. der Wissenschaften, Wien, Band XLII., No. 22-28, 1860, *from the Society*; Nachrichten von der Georg-Augusts-Univ. u. der K. Gesellsch. der Wissensch., Göttingen, 1860, No. 1-29, *from the Society*; Bull. de la Société Linnéenne de Normandie, Vol. V., 1859-60, Caen, 1861, *from the Society*; Mém. de l'Acad. Imperiale de Metz, Ann. XLI., 1859-60, *from the Academy*; Jahrbücher des Vereins für Naturk. in Nassau, XIV. Heft, Wiesbaden, 1859, *from the Society*; Dr. J. C. Ed. Hoser's Rückblicke, Prag, 1848, von Dr. Wettenweber, — Sitzungsab. der K. böhm. Gesellsch. der Wissenschaften, Prag, 1859, Juli-Dec.—1860, Jan.-Juni, *from the Society*; I. Bericht des Offenbacher Vereins für Naturk., 1860, *from the Society*; Würzburger Medicin. Zeitschrift, II. Band, 1-2 Heft, 1861, *from the Society*; Der Zoologische Garten, von Dr. D. F. Weinland, Jahrg. II., No. 1-6, 1860-61, *from the Editor*; XX. Bericht über das Museum Francisco-Carolinum, Linz, 1860, *from the Institution*; Monatsb. der K. Preuss. Akad. der Wissenschaften, 1860, Berlin, — General Register, 1836-58, Berlin 1860, *from the Academy*; Gelehrte Anzeigen, Vol. 49 & 50, — Sitzungsab. des K. bayer. Akad. der Wissenschaften, 1860, Heft 1-3, München, — Verzeichniss der Mitglieder, 1860, — Bedeutung der Sanskritstudien, von Dr. Wilh. Christ, 1860, — Denkrede auf. Alex. von Humboldt, von C. F. P. von Martius, 1860, — Grenzen und Grenzgebiete der physikalischen Forschung, von Dr. C. H. ^{Tommy}; Proc. Acad. ^{Sci.} ^{the} ^{nn.} Rep. of

I don't know why as broad
invol 6-8 sub, est largest

4-5 City



0 1 2 3 4 5 6 7 8 9 10

cm

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Dr. Koch presented specimens of quartz and of the silicious conglomerate from Madison County mentioned in Dr. Hilgard's letter.

Dr. Engelmann stated that the mean temperature of July (77.°5) had been lower than the usual mean of that month, and that the fall of rain during the same month (2.04 inches) was about one-half less than usual.

Dr. Wislizenus stated that the mean of atmospheric electricity of July had been 3.5° less than that of the month previous, and that the amount had been gradually decreasing since winter.

—
August 19, 1861.

The President, Dr. ENGELMANN, in the chair.

Six members present.

A letter was read from A. F. Bandelier, Jr., Highland, Ill., Aug. 1, 1861, communicating meteorological observations at Highland.

The following donations to the library were received:

Bull. de la Société Géologique de France, Ser. ii., T. XVIII., Feuilles 13-14, 22-31, Paris, 1861, from the Society; Proc. Amer. Phil. Society, Philad., Vol. XVIII., No. 65, 1861, from the Society; Jour. Franklin Inst., Philad. A. 1861, from the Institute; Proc. Acad. Nat. Sci., Philad., the Academy; *l'apoteo*



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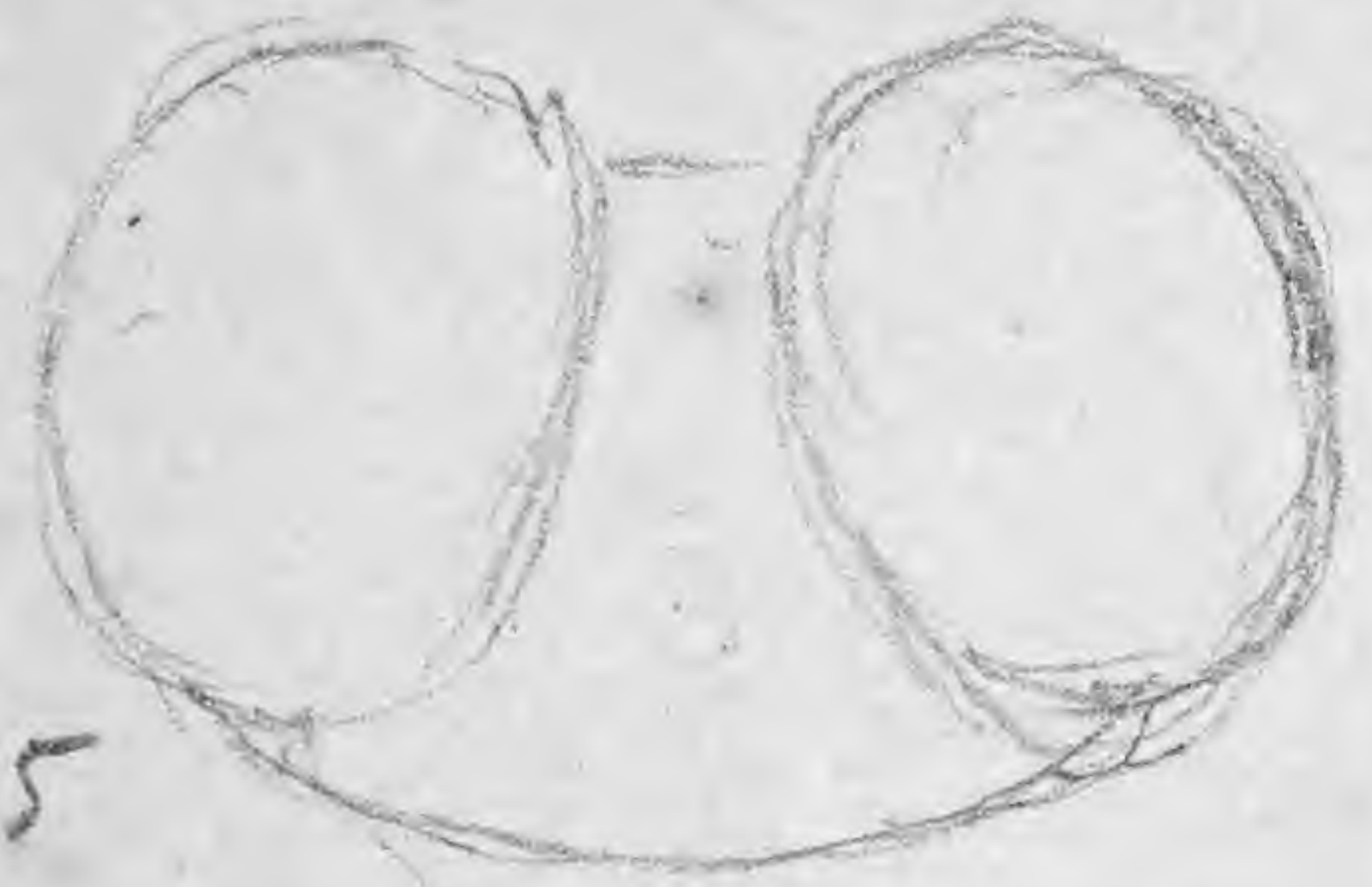
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X415

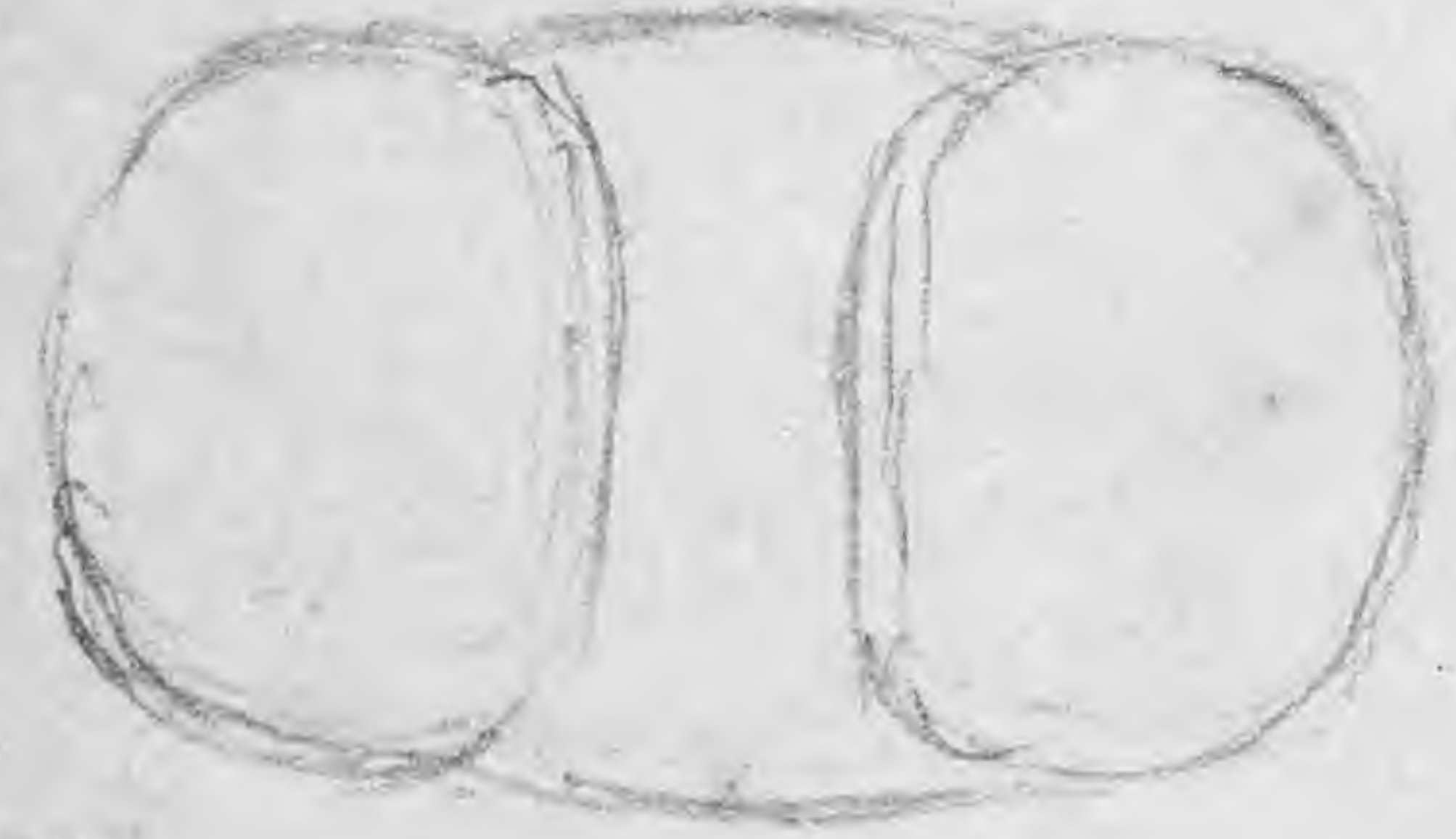
Pinus muricata
Dr Parry, Monterey May 1850

Sept 24 1863

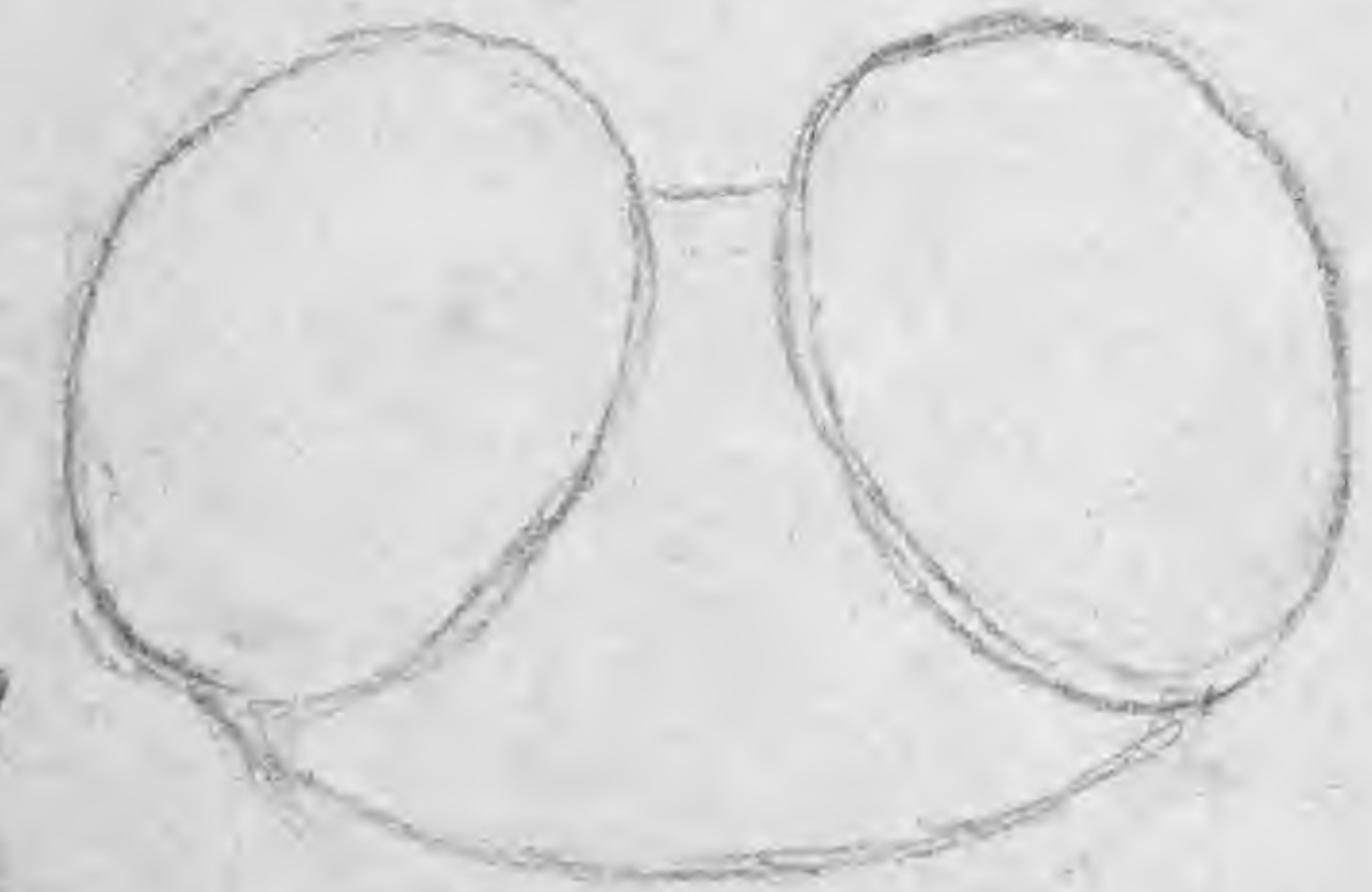
0.035



0.039



0.037

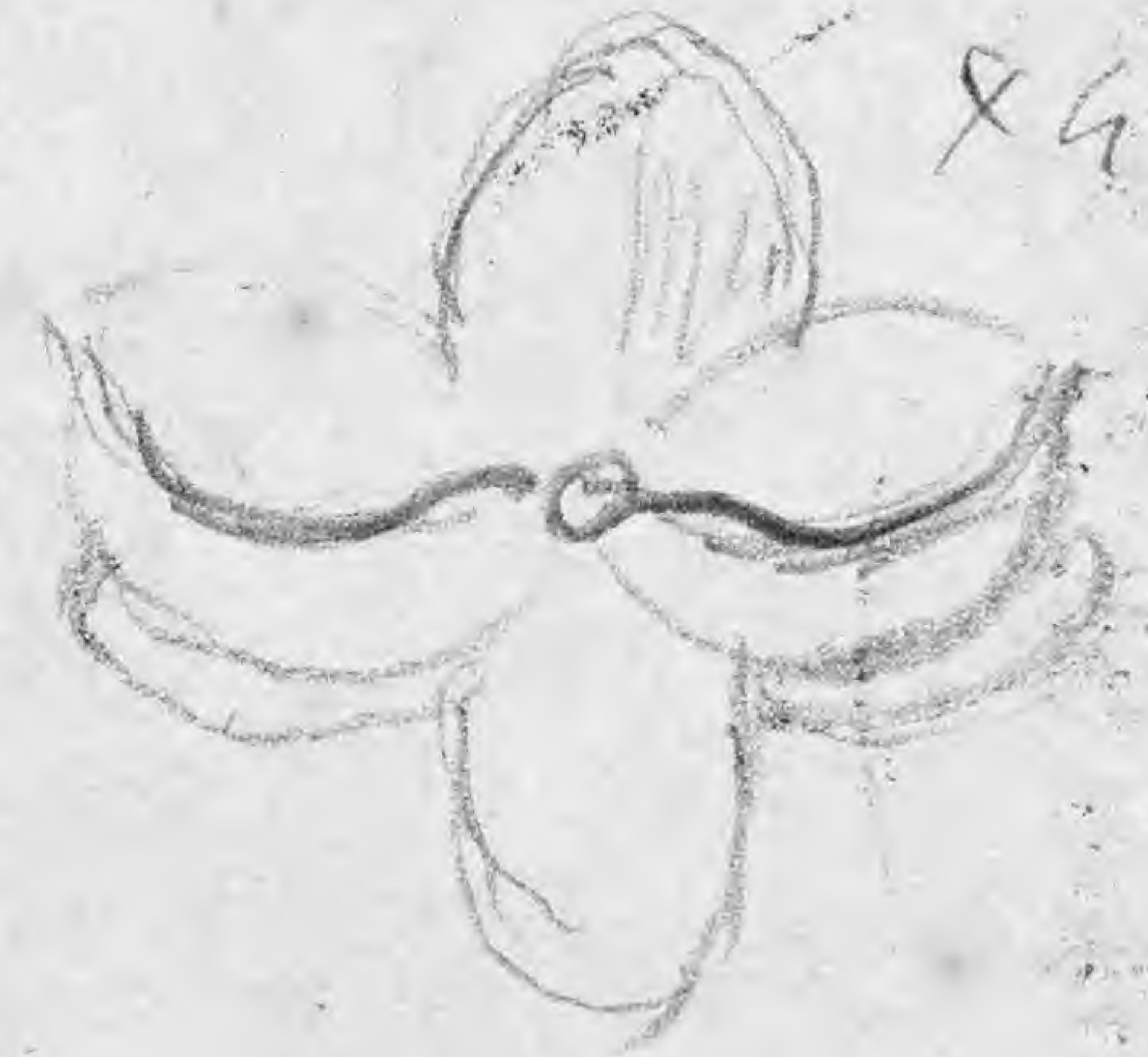


x4



upper side

x4



x10



6 inwd
scales

4 outer ones almost equal
axis of inflorescence 10-11 lines
bracts somewhat persistent 2^d year

principally 0.037

0.025 - 0.039



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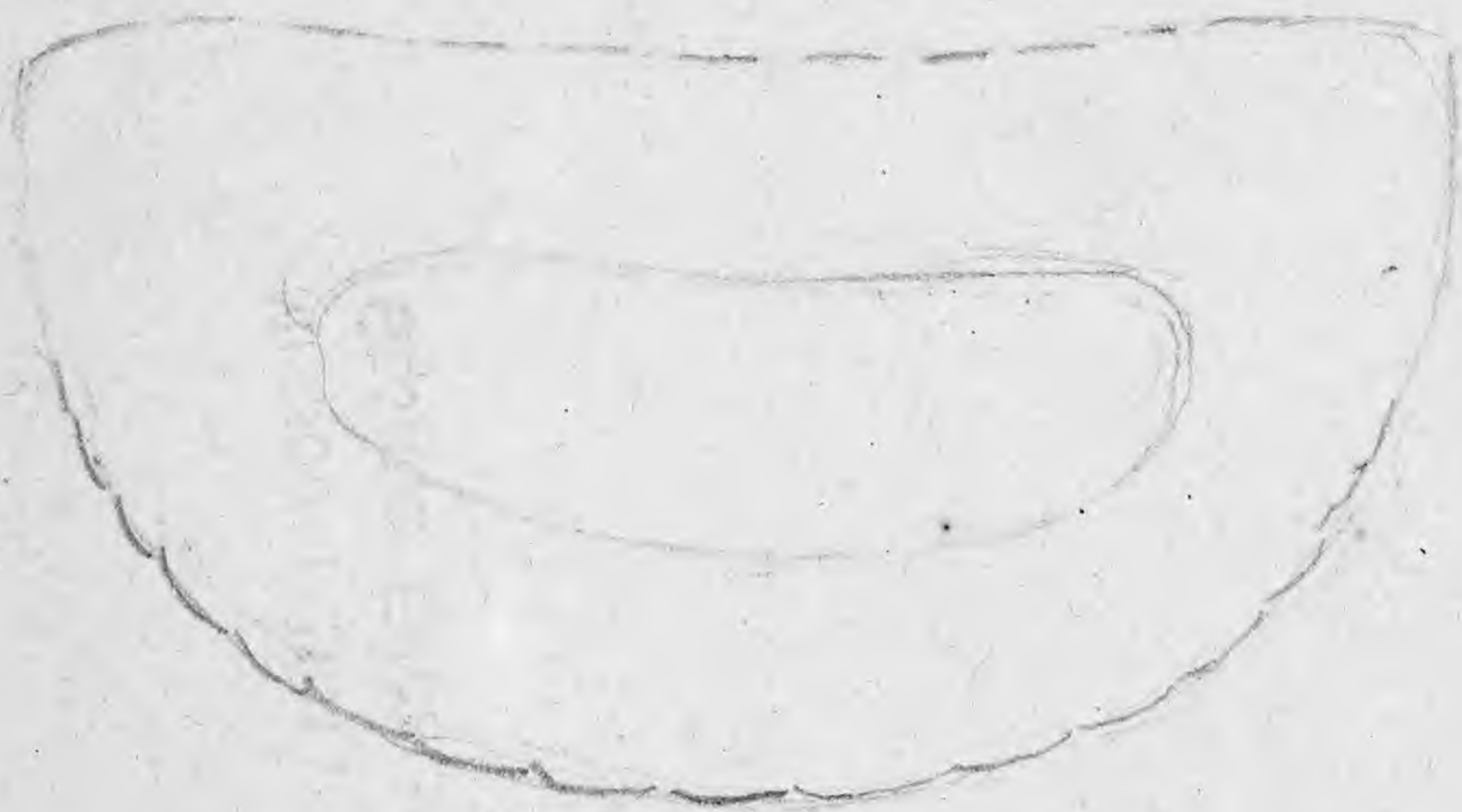


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Pinus muricata
Monterey, Bolander

Oct 24, 1870

x30



leaves 80-140 mm long
(smaller ones on dependent
branchlets)
sheaths (acutemid?) 23 mm long
consisting of 9-10 bracts

x60



edge of same leaf

middle near tip



x30



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Rhus *hirsuta* ?

May 16 1878

(under tuberculata ?)

Blair 1865 ?



x30

hypoderm sparing,
 detached thin layers
 all around, interrupted,
 none inside of leaf



x60



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cm

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No 2 Bolander

P. contorta

March 10 1865

size of Pollen x415

Bolander

"Pitch pine"

—|||— = 0.039 - 0.044

March 12 1864



anthers x 10



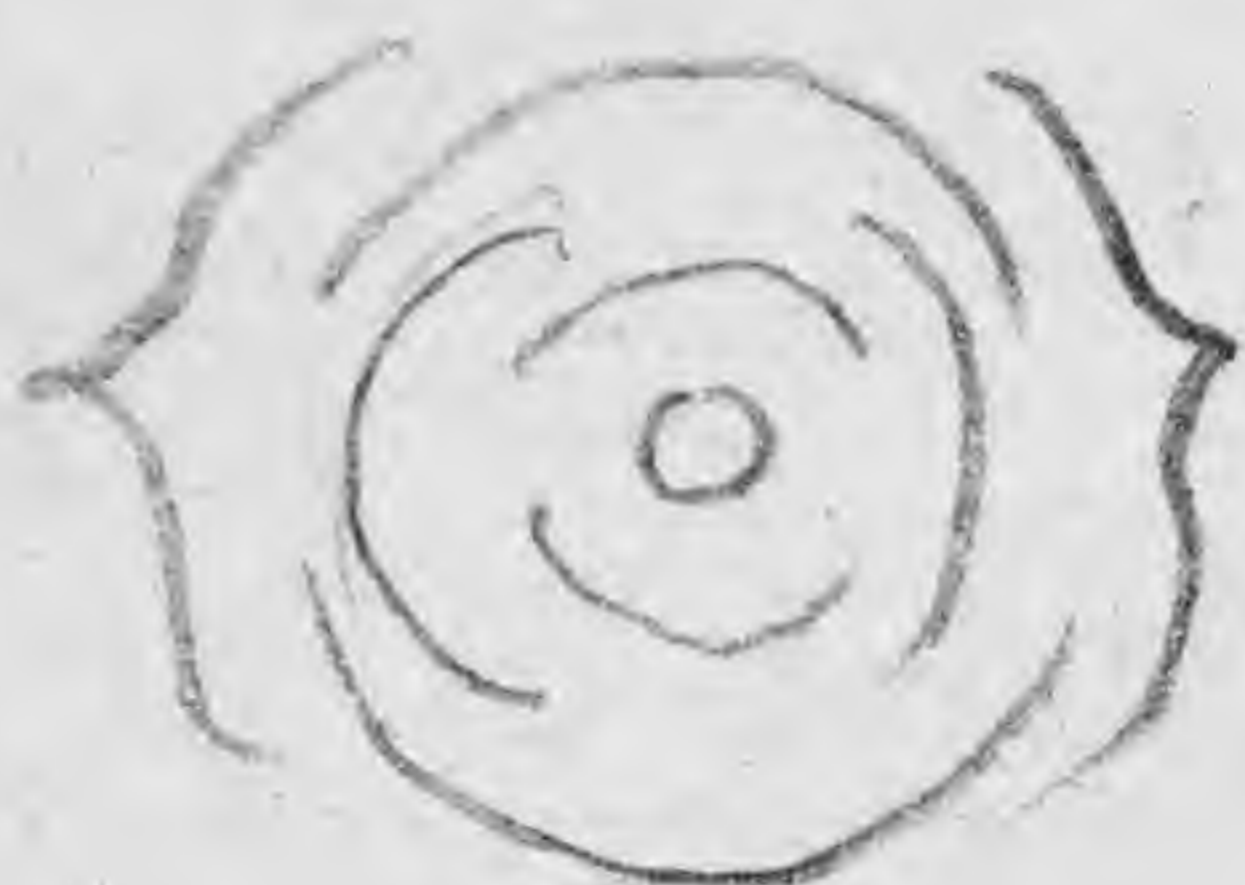
crista very low
denticulate - lacinate



x4



longstipes

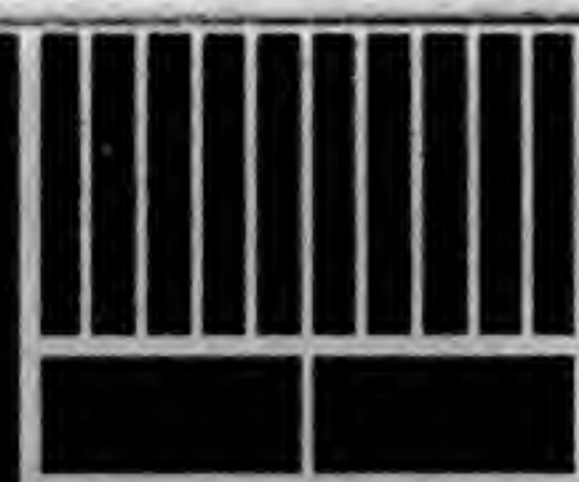


8 scales on
old effete shoot



6 scales
on young undeveloped
shoots of same branch!

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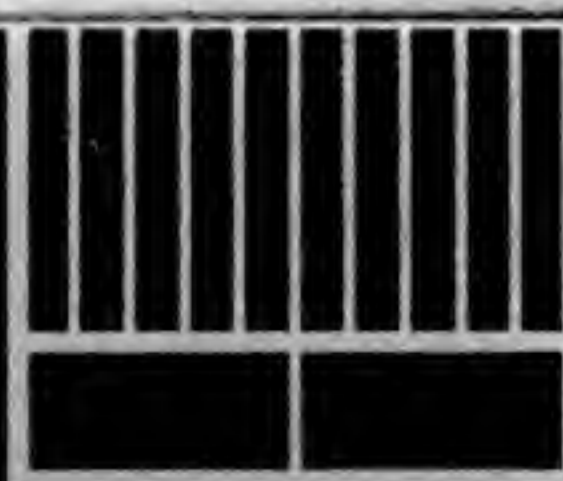
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Bolander No 2

P. Contorta
Bolander

March 6 1865

short ones

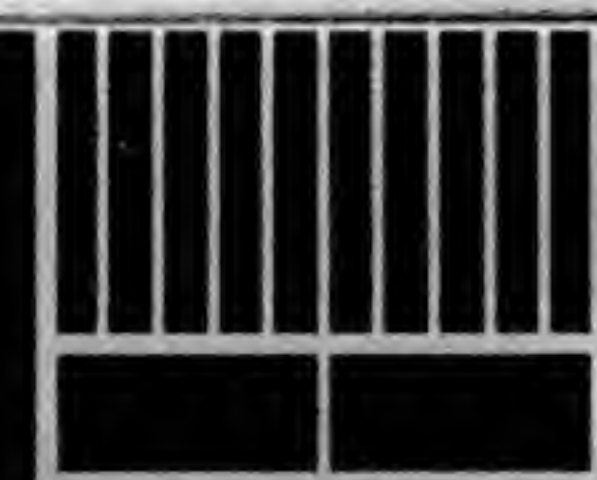


Embryo X10

3 with 5 styles

1 - 4 - -

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